

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/GB2004/002649	International filing date (day/month/year) 18.06.2004	Priority date (day/month/year) 19.06.2003
International Patent Classification (IPC) or national classification and IPC G06T7/00		
Applicant DEK INTERNATIONAL GMBH et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 12 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 28.10.2005	Date of completion of this report 09.01.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Gauthier, J-C Telephone No. +49 30 25901-423	

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**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/002649

Box No. 1 Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-50 as originally filed

Claims, Numbers

1-45 as originally filed

Claims, Pages

51-57 as originally filed

Drawings, Sheets

1/17-17/17 as originally filed

Drawings, Figures

1-26 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/002649

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
☒ claims Nos. 7, 8, 10-22, 30, 31, 33-45

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 7, 8, 10-22, 30, 31, 33-45
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
- | | |
|----------------------------|------------------------------------------------------------|
| the written form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |
| the computer readable form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/002649

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-6,9,23,24-29,32 .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4,27
	No: Claims	1-3,5,6,9,23-26,28,29,32
Inventive step (IS)	Yes: Claims	
	No: Claims	1-6,9,23-29,32
Industrial applicability (IA)	Yes: Claims	1-6,9,23-29,32
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item IV.

The separate inventions/groups of inventions are:

1-6,9,23,24-29,32

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to scan continuously and progressively across the printing screen and the workpiece (P1)

7,8,30,31

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to perform the inspection based on captured analog signals (P2)

10,33

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to compare dimensions of printed deposit with their expected dimension (P3)

11-13,34-36

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to reduce the total inspection time (P4)

14-19,37-42

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to compare the coverage of printed deposit with their expected coverage (P5)

20-22,43-45

In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to segment the captured images (P6)

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The prior art has been identified as document EP 1000 529 (D1). This document discloses the subject matter of claims 1-3, 5-6, 9, 23, 25-26, 28-29, 32 (see Re Item V hereafter),

which hence are not new in the sense of Article 33(2) PCT.

1. The following technical feature of claims 1-6,9,23,24-29,32 (Group 1) makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

- . The camera unit is a line-scan camera unit for capturing line-scan images (STF1)

The problem solved by this special technical feature can therefore be construed as:

- . In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to scan continuously and progressively across the printing screen and the workpiece (P1)

2. The following technical features of claims 7,8,30,31 (Group 2) make a contribution over the prior art and can be considered as special technical features within the meaning of Rule 13.2 PCT:

- . The images are defined by signals having intensities in dependence upon the imaged features (STF2-i)
- . The points defining the images are time-sliced components of the signals (STF2-ii)

The problem solved by these special technical features can therefore be construed as:

- . In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to perform the inspection based on captured analog signals (P2)

3. The following technical feature of claims 10,33 (Group 3) makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

- . The relationship of the points of deposit to the points of aperture is determined from a count of the number of pixels of deposit relative to the number of pixel of aperture

(STF3)

The problem solved by this special technical feature can therefore be construed as:

. In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to compare dimensions of printed deposit with their expected dimension (P3)

4. The following technical feature of claims 11-13,34-36 (Group 4) makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

. The control unit is configured to acquire images in accordance with an inspection schedule defining a plurality of inspection sites (STF4)

The problem solved by this special technical feature can therefore be construed as:

. In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to reduce the total inspection time (P4)

5. The following technical feature of claims 14-19,37-42 (Group 5) makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

. The print characteristic comprises a representation of a percentage of a determined deposit coverage as compared to an expected deposit coverage (STF5)

The problem solved by this special technical feature can therefore be construed as:

. In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to compare the coverage of printed deposit with their expected coverage (P5)

6. The following technical feature of claims 20-22, 43-45 (Group 6) makes a contribution

over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

- . The points determined to be of deposit are determined by reference to a reference threshold value of image intensity (STF6)

The problem solved by this special technical feature can therefore be construed as:

- . In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to segment the captured images (P6)

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

Re Item V.

- 1 Reference is made to the following document:

D1 : EP-A-1 000 529 (EKRA EDUARD KRAFT GMBH)
17 May 2000 (2000-05-17)

D2 : US-A-4 578 810 (MACFARLANE ET AL)
25 March 1986 (1986-03-25)

- 2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-3,5,6,9,23-26,28,29, and 32 is not new in the sense of Article 33(2) PCT.

2.1 INDEPENDENT CLAIM 1

Document D1 discloses :

"An inspection system for inspecting deposits printed on workpieces through a printing screen" (D1, col. 6, ll. 22 to 52; Figure 1)

"the system comprising: a camera unit movable relative to a printing screen" (D1, col. 6, [0018]; Figure 1)

"printing screen comprising a body including a plurality of apertures" (D1, col.7, ll. 37-50)

"and a workpiece on which deposits are printed through the apertures of the printing screen" (D1, col. 1, ll. 27-30)

"and a control unit operable to control the camera unit such as to capture images of at least one pair of corresponding regions of the printing screen and the workpiece" (D1, col.7, ll.3-11 and ll.18-22; Figures 1 and 2)

"and process the images to determine, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece, as defined by a corresponding plurality of points, is of deposit" (D1, col. 8, ll 5-13; §§ [0034] and [0036]; Either the pixels of images of printing screen and workpiece, or the coordinates of aperture, being "points")

"thereby enabling a determination of a print characteristic of deposits printed on the workpiece from a relationship of the points determined to be of deposit to the points determined to be of aperture" (D1, col.7, ll. 37-50 and col. 8, ll. 5-13)

Therefore the subject-matter of independent system claim 1 is not new in the sense of Article 33(2) PCT.

2.2 INDEPENDENT CLAIMS 23 and 24

The reasoning applied to independent claim 1 can be applied, *mutatis mutandis*, to the subject-matter of the corresponding independent claims 23 and 24 which therefore are also considered not new in the sense of Article 33(2) PCT.

2.3 DEPENDENT CLAIMS 2, 3, 5, 6, 9, 25, 26, 28, 29, 32

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/GB2004/002649

Dependent claims 2, 3, 5, 6, 9, 25, 26, 28, 29, 32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty in the sense of Article 33(2) PCT, see document D1 and in particular the corresponding passages cited in the search report.

3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 4 and 27 does not involve an inventive step in the sense of Article 33(3) PCT.
- 3.1 The combination of the features of dependent claim 4 is not known from the available prior art. The corresponding subject matter is therefore regarded as novel in the sense of Article 33(2) PCT.

The subject-matter of claim 4 differs from the inspecting method of document D1 in that :

. The camera unit is a line-scan camera unit for capturing line-scan images

The problem to be solved by the present invention may therefore be regarded as :

. In an inspection system for inspecting deposits printed on workpieces through a printing screen, how to scan continuously and progressively across the printing screen and the workpiece

The solution proposed in claim 4 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

The feature of line-scan camera features have already been employed for the same purpose in a similar inspection system, see document D2, Figures 1,2 and 3, along with the description on column 5, line 46 to column 6, line 41.

It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to an inspection system according to document D1, thereby arriving at an inspection system according to claim 4.

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/GB2004/002649

- 3.2 The combination of the features of dependent claim 27 is not known from the available prior art. The corresponding subject matter is therefore regarded as novel in the sense of Article 33(2) PCT.

The reasoning applied to dependent claim 4 can be applied, mutatis mutandis, to the corresponding subject-matter of dependent claims 27 which therefore is also considered not inventive.